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COMPARING EFFICIENCY AND PRODUCTIVITY IN ISLAMIC BANKING: CASE STUDY IN INDONESIA, MALAYSIA AND PAKISTAN

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Abstract. Comparing Efficiency and Productivity in Islamic Banking: Case Study in Indonesia, Malaysia, and Pakistan. *The objective of this research is to analyze both efficiency and productivity of Islamic Banking Industry in Indonesia, Malaysia and Pakistan. The technique that used in this research is Data Envelopment Analysis (DEA) as for measuring efficiency and thus Malmquist Index (MI) as for measuring productivity. The result of this research found that Islamic Banking Industry in Indonesia is facing inefficiency that shown by five years average that is not reach 100% efficiency rate. Malaysia also experiences the problem of inefficiency but the condition is better compared to Indonesia. In five years, the efficiency rate of Malaysia Islamic Bank has not reach 100% efficiency rate. Pakistan among the closest country that could reach an efficient rate level for their Islamic banks. Pakistan close to reach 100% efficient rate within the last five years.*

Keywords: *data envelopment analysis, efficiency, malmquist index, productivity*

Abstrak. Perbandingan Efisiensi dan Profitabilitas Perbankan Syariah: Studi Kasus di Indonesia, Malaysia, dan Pakistan. *Tujuan dari penelitian ini ialah untuk menganalisis efisiensi dan profitabilitas industri perbankan syariah di Indonesia. Teknik yang dipergunakan dalam penelitian ini ialah data envelopment analysis (DEA) untuk mengukur efisiensi dan indeks Malmquist untuk mengukur produktivitas. Hasil penelitian menunjukkan bahwa industri perbankan syariah cenderung kurang efisien, hal ini diperlihatkan oleh data rata-rata lima tahun terakhir yang tidak mampu mencapai tingkat efisiensi 100%. Malaysia turut pula menghadapi permasalahan inefisiensi, namun kondisi ini lebih baik dibandingkan Indonesia. Dalam lima tahun terakhir, tingkat efisiensi industri perbankan syariah di Malaysia tidak mencapai tingkat efisiensi 100%. Pakistan merupakan salah satu Negara yang hampir mencapai tingkat efisiensi pada industri perbankan syariahnya. Pakistan mendekati tingkat efisiensi rata-rata 100%.*

Kata kunci: *data envelopment analysis, efisiensi, indeks malmquist, produktivitas*

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Introduction

The Indonesian Islamic banking industry had growing rapidly. Nowadays, Islamic banking in Indonesia must able to compete with conventional banks. To increase the competitiveness of Islamic banking industry, the Islamic banks required to operate efficiently. This things to achieve the optimum profit and productivity.

Measurement of the efficiency of the financial ratios can't detect internal and external factors cause inefficiency. Banking management also cannot be analyzed through financial ratios. Therefore, it is necessary to measure the efficiency to get more good approach. As it is described above, the measurement of efficiency and profitability in Islamic banking is very important. With known levels of efficiency and profitability levels, it will show the overall performance of Islamic banks. There are some factors that cause inefficiencies, which can also be known that Islamic banks can do a proper evaluation to improve performance and increase competitiveness (Hossen & Rahmawati, 2016).

Yudistira (2004) using Data Envelopment Analysis (DEA) toward 18 Islamic banks, the results of the study revealed that inefficiency experienced by the 18 banks is only touched at 10% a little more, it means quite low when compared to conventional banks. Bank of the sample in this study experienced hard times when passing time of global crisis in 1998-1999. However, it performs very well afterwards, the findings in this study also indicate the existence of diseconomy scale in small to medium sized banks so it is recommended that merger should be done. Sufian (2007) perform the test with five elaboration, Productivity Change (TPCH), Technological Change (TECHCH), Efficiency Change (EFFCH), Pure Technical Efficiency Change (PEFFCH) and Scale Efficiency Change (SECH). The results of this study showed the productivity of Malaysian Islamic banks touching productivity by 8.4% in 2002, increased to 11.2% in 2003 before eventually decreased by 4.6% in 2004. Ahmed, et.al (2009) shows that the government of Pakistan has succeeded in increasing effectiveness and productivity of the banks in the domestic domain through improvement/reforms of its financial sector.

On efficiency and productivity of financial institutions in general, there is quite a lot of research exploring particularly in the form of financial institutions such as bank. It is no surprise because the banking industry itself has been established since a long time in the form of conventional model and continues to grow until alternative banking is available, such as Islamic banking.

The purposes of this research are: first, compare the efficiency rate in Islamic banking industry between Indonesia, Malaysia, and Pakistan. Second, compare the Islamic banking productivity between Indonesia, Malaysia, and Pakistan.

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Literature Review

Ellahi, et.al (2011) find that Islamic banks are less efficient than conventional banks, because it is not yet to (be) introduced well by the market, and Islamic banks need more funding to get the source of deposit. The Anova test result shows a significant difference for TE as well as for CE between conventional banks and Islamic banks. Hassan (2006) conduct a testing within the scope of cost profit, revenue and X-efficiency of Islamic banks in the world not only by using stochastic cost frontier approach as a method, but also perform the testing with could be performed in conjunction with conventional accounting ratios in determining the performance of Islamic banks. Although Islamic banks are relatively less efficient in containing cost, they are relatively efficient in generating profit. The average allocate efficiency is 74%, whereas the average technical efficiency is about 84%. This means that the dominant source of inefficiency is due to allocate inefficiency rather than technical inefficiency. These results are consistent with the fact that the Islamic banks operate in overall regulatory environments, which are not very supportive of their operations. Mghaieth and El Mehdi (2014) focus on finding the determinants of Islamic banking around economy crisis timeline, 2007-2008. It shows the samples (banks) has 82.13% rate of cost efficiency and 82.47 % rate of profit efficiency.

Mohamad, et.al (2008), in Efficiency of Conventional versus Islamic Banks: International Evidence using the Stochastic Frontier Approach (SFA), Measures and compares the cost and profit efficiency of 80 banks in 21 of Organization of Islamic Conference (OIC) countries: 37 conventional banks and 43 Islamic banks, using the Stochastic Frontier Approach (SFA). In addition, it assesses the efficiency of those banks based on their size, age, and region. The findings suggest that there are no significant differences between the overall efficiency results of conventional versus Islamic banks. However, there is substantial room for improvement in cost minimization and profit maximization in both banking systems. Furthermore, the findings show no significance difference in average efficiency scores between big versus small and new versus old banks in both banking streams. This implies that size and age did not affect the performance of banks in both streams. Overall, the results are in favor of the more recent Islamic banking system.

Mediadianto (2007) consisted of measurement of efficiency rate for both conventional and Islamic banks using DEA, the data comes from 3 Islamic bank: Bank of Muamalat Indonesia, Bank of Sharia Mandiri, and Bank of Mega Sharia. Whereas the conventional one represented by: Bank of Artha Graha International, Bank of Ekspor Impor Indonesia and Bank of Swadesi. From the asset and production approach it can be inferred the average score of Islamic bank is better than conventional one.

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Setiawan (2007) concluded that the inefficiency of banking in Indonesia is generally caused by the inefficiency of operating costs and inefficiencies of rupiah credit costs. Although banks forming the DEA are considered as an efficient bank, in fact, the high net interest margin of these banks is caused by high profits mark-up as well as high risk mark-up. Indrawati (2009) shows that the commercial banks in Indonesia are relatively inefficient.

Berger, et.al (2007) analyzed the profit and cost efficiency using 266 pieces of annual observation data from 38 banks in the period of 1999-2003. The empirical results of this study stated that the reforms undertaken against banks in China in the form of reduction in government ownership and extend the gateway for foreign investors have brought very strong positive effect on the efficiency. Luciano and Regis (2007) conclude that there seem to be economies of scale at the beginning of the period, while they do not seem to characterize more.

Jajri (2008) reveals that in general TFP growth in SMIs is negative due to negative contribution from both technical efficiency and technical change. However, analysis by sub industries indicates some positive TFP growth especially in the light industries like food and beverages, textiles and plastic products that merely come from positive contribution of technical efficiency. The heavy SMIs like transport equipment and chemical products seem less efficient and at the same time do not gain positive growth in technical change that subsequently resulted in negative growth of TFP. The study also finds that technical change is a significant determinant of SMIs output growth in six sub industries: food and beverages, textiles, wood products, plastic products, electrical electronics and transport equipment. In other industry sub groups the relationship are positive but not significant.

Based on the literature review above, shows that measurement of efficiency and productivity of certain industrial area and the usage of DEA are become a common in general and thus we can also inferred that there is a gap that needs to be filled, which not only to update the above mentioned works but also because a comprehensive study about efficiency and productivity on Islamic banking in Indonesia, Malaysia and Pakistan.

Method

This research is mainly using time-series secondary data derived from bank financial reports, statements publication, and other related, relevant data source if necessary. It can be in form of digital data such as web sites, digital files or non-digital data such as paper, magazine and sort. This research purpose is to measure efficiency and productivity of Indonesia, Malaysia and Pakistan Islamic banking, to achieve

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that purpose data processing techniques which will be used are as follows: First, Data Envelopment Analysis (DEA) for efficiency measurement. Second, malmquist Index (MI) is using to measure the productivity in Islamic banking industry.

There's generally three types approaches to determine which proxies, which will be the variables, those three approaches are asset, production and intermediation. Each approach considers the X and Y relation. Whereas most research tend to use intermediation approaches. Intermediation (Yudistira, 2004) approaches assumes that bank is and institution which doing intermediary function that is bank is positioned as the one who bridging the deficit with the surplus one, with this assumption then the bottom line is that total deposits will be considered as X variable while loans, funding and financing will considered as output. This research is using three input variables (such as: staff cost, fixed cost, and total deposit) and three output variables (such as: total loans, incomes, and liquid assets.

The data will be analyze using the help of software whereas the result will indicate how does efficiency and productivity a bank, it can be seen through the indicates: (1) DEA, Indicator of efficiency, value of: (a) CRS (Constant Return to Scale); (b) VRS (Variance Return to Scale); (c) SE (Scale Efficiency). (2) Malmquist, Indicator of productivity, value of: (a) EFFCH, efficiency change related to CRS DEA; (b) PECH, efficiency change related to VRS DEA; (c) SECH, efficiency change related to SE DEA; (d) TECH, technological change; (e) TFPCH, Total Factor Productivity change.

Result and Discussion

Efficiency Measurement

Here are the results of analysis on the Islamic banking performance in Indonesia in terms of efficiency; performance calculation was performed by the method of Data Envelopment Analysis (DEA).

Efficiency Measurement in Indonesia

The average value of efficiency for each bank within a period of five years by order of the most efficient level (value 1) to the lowest relatively efficient level (value <1) are shown in Table 1, namely: The first rank (Value 1): Bank of DKI Sharia, Bank of Permata Sharia, Bank of BTN Sharia, followed by the next rankings with relatively efficient condition (value <1), by order of ranking 2, such as: Bank of Kalsel Sharia (0.9454); Third ranking is Bank Riau Sharia (0.9416); Rank number four is Bank of Sumut Sharia (0.9152); Rank number 5 is Bank of Kaltim Sharia (0.915); Number 6 is Bank of Mega Sharia (0.8528); Rank number seven is Bank

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of Muamalat (0.7932); Number 9 is Bank of Sharia Mandiri (0.739); Rank number 9 is Bank of Sharia Bukopin (0.7328); The rank 10 is Bank of BRI Sharia (0.6616).

Table 1. CRS: Average efficiency value within 5 years

Ranking	Name of Bank	CRS Value
1	Bank of DKI Sharia	1
1	Bank of Permata Shariah	1
1	Bank of BTN Sharia	1
2	Bank of Kalsel Sharia	0,9454
3	Bank of Riau Sharia	0,9416
4	Bank of Sumut Sharia	0,9152
5	Bank of KalTim Sharia	0,915
6	Bank of Mega Sharia	0,8528
7	Bank of Muamalat	0,7932
8	Bank of Sharia Mandiri	0,739
9	Bank of Sharia Bukopin	0,7328
10	Bank of BRI Sharia	0,6616

In Table 2, the average value of efficiency for each bank within a period of five years by order from the most efficient level (value 1) to the lowest relatively efficient value (value <1), i.e: first rank are Bank of Kalsel Sharia, Bank of DKI Sharia, Bank of Permata Sharia, Bank of Sharia Mandiri, Bank of Muamalat, Bank of BTN Sharia; the second rank was Bank of Mega Sharia (0.985); The third rank was Bank of Riau Sharia (0.961); Bank of Sumut Sharia ranked the fourth (0.9356); Bank of KalTim Sharia got the fifth place (0.927), Bank of BRI Sharia ranked the sixth (0.9152), and Bank of Sharia Bukopin ranked the seventh (0,8762).

Table 2. Ranking of average value within 5 years: VRS Output Orientation

Ranking	Name of Bank	Average Value
1	Bank of KalSel Sharia	1
1	Bank of DKI Sharia	1
1	Bank of Permata Sharia	1

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1	Bank of Sharia Mandiri	1
1	Bank of Muamalat	1
1	Bank of BTN Sharia	1
2	Bank of Mega Sharia	0,985
3	Bank of Riau Sharia	0,961
4	Bank of Sumut Sharia	0,9356
5	Bank of Kaltim Sharia	0,927
6	Bank of BRI Sharia	0,9152
7	Bank of Sharia Bukopin	0,8762

The value of average efficiency for each bank within a period of five years by order from the most efficient level (Value 1) to the lowest relative efficiency (N <1), were: the first ranking with full efficiency values (value 1) were: Bank of DKI Sharia, Bank of Permata Sharia, Bank of BTN Sharia; The second ranked by Bank of Kaltim Sharia (0.9858); Bank of Riau Sharia in the third rank (0.9786); fourth-ranked was Bank of Sumut Sharia (0.977); The fifth was Bank of KalSel Sharia (0.9454), the sixth was Bank of Mega Sharia (0.8678), seventh for Bank of Sharia Bukopin (0.8418), eighth rank for Bank of Muamalat (0.7932), the ninth was Bank of Sharia Mandiri (0.739), and the tenth was Bank of BRI Sharia (0.7318), can be seen in more detail in the Table 3.

Table 3. Ranking of average value within 5 years of sharia banking: SE Input Orientation

Ranking	**Name of Bank**	**Average Value**
1	Bank of DKI Sharia	1
1	Bank of Permata Sharia	1
1	Bank of BTN Sharia	1
2	Bank of KalTim Sharia	0,9858
3	Bank of Riau Sharia	0,9786
4	BPD Sumut	0,977
5	BPD Kalsel Syariah	0,9454
6	Bank Mega Syariah	0,8678

7	Bukopin Syariah	0,8418
8	Bank Muamalat	0,7932
9	BSM	0,739
10	BRI Syariah	0,7318

Efficiency Measurement in Malaysia

Based on screening process in order to filter and gather decent research objects and forming amounts of data base, which are limited to general criteria that data collected must be from bank which operational in recent five years in range of 2009 to 2013. We found sixteen Islamic banking in Malaysia, as like the Table 4.

Table 4. List of Sharia Banking in Malaysia, 2009-2013

No	Name of Bank	No.	Name of Bank
1	Affin Islamic Bank Berhad	9	Pembangunan Malaysia Berhad
2	Agrobank Islmic Banking	10	Export Import Bank of Malaysia Bhd
3	Al Rajhi Malaysia	11	Hong Leong Islamic Bank
4	Alliance Islamic Bank Berhad	12	KAF Islamic Bank
5	Am Islamic Bank Berhad	13	KFH Malaysia
6	Asian Finance Bank Berhad	14	MIDF Amanah Investment Bank Bhd
7	Bank Kerjasama Rakyat Malaysia Berhad	15	Public Islamic Bank Berhad
8	Bank Muamalat Malaysia Berhad	16	RHB Islamic

Here are the results of analysis on the Islamic banking performance in Malaysia in terms of efficiency; performance calculation was performed by the method of Data Envelopment Analysis (DEA). Based on DEA CRS, inefficiency occurs in: 8 banks in 2009 (Bank: 1, 3, 5, 6, 7, 12, 13 and 16); 6 banks in 2010 (Bank: 3, 4, 5, 6, 8 and 16); 5 banks in 2011 (Bank: 2, 3, 5, 7, and 8); 6 banks in 2012 (Bank: 2, 3, 5, 6, 7, 8, 13, and 16); 4 banks in 2013 (Bank: 3, 5, 7 and 16). Based on DEA VRS, for input orientation, inefficiency occurs in: 5 banks in 2009 (Bank: 1, 3, 12, 13 and 16); 1 bank in 2010 (Bank: 3); 2 banks in 2011 (Bank: 2 and 3); 3 banks in 2012 (Bank: 2, 3 and 13); 1 bank in 2013 (Bank: 3). For VRS output inefficiency occurs in: 5 banks in 2009 (Bank: 1, 3, 12, 13 and 16); 1 bank in 2010 (Bank: 3); 2 banks in 2011 (Bank: 2 dan 3); 3 banks in 2012 (Bank: 2, 3 and

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13); 1 bank in 2013 (Bank: 3). Based on DEA SE input orientation, inefficiency occurs in: 8 banks in 2009 (Bank: 1, 3, 5, 6, 7, 12, 13, and 16); 6 banks in 2010 (Bank: 3, 4, 5, 6, 8 and 16); 5 banks in 2011 (Bank: 2, 3, 5, 7 and 8); 8 banks in 2012 (Bank: 2, 3, 5, 6, 7, 8, 9, 13 and 16); 4 banks in 2013 (Bank: 3, 5, 7 and 16). For DEA SE Output Orientation, inefficiency occurs in: 8 banks in 2009 (Bank: 1, 3, 5, 6, 7, 12, 13 and 16); 6 banks in 2010 (Bank: 3, 4, 5, 6, 8, and 16); 5 banks in 2011 (Bank: 2, 3, 5, 7 and 8); 8 banks in 2012 (Bank: 2, 3, 5, 6, 7, 13 and 16); 3 banks in 2013 (Bank: 3, 5 and 7).

Efficiency Measurement in Pakistan

Based on screening process in order to filter and gather decent research objects and forming amounts of data base, which are limited to general criteria that data collected must be from bank which operational in recent five years in range of 2009 to 2013. We found five Islamic banking in Pakistan, as like the Table 5.

Table 5. List of Sharia Banking in Pakistan, 2009-2013

No.	Name of Bank
1	Affin Islamic Bank Berhad
2	Agrobank Islamic Banking
3	Al Rajhi Malaysia
4	Alliance Islamic Bank Berhad
5	AmIslamic Bank Berhad

Based on DEA CRS, inefficiency occurs in: 2 banks in 2009 (Bank: 1 and 2); 3 banks in 2010 (Bank: 2, 3 and 4); 1 bank in 2011 (Bank 2) and 2012 (Bank 2), this is valid for both input and output orientation. Based on DEA VRS, inefficiency occurs in: 2 banks in 2009 (Bank: 1 and 2); and 1 bank in 2010 (Bank 4). This is applicable for both input and output orientation. Based on DEA SE, inefficiency occurs in: 2 banks in 2009 (Bank: 1 and 2); 3 banks in 2010 (Bank: 2, 3 and 4); 1 bank in 2011 and 2012 (Bank 2). This is valid for both input and output orientation.

Productivity of Islamic Banking

Productivity measurement performed using Malmquist Index is available on DEAP 2.1 software. Measurements are performed with input orientation or output

orientation. The results of calculation with this software will generate numbers in some kind of test as an indicator.

Table 6. Malmquist Index Islamic Bank in Indonesia (EFFCH)

	(EFFCH) Input Oriented Efficiency Change (EFFCH) CRS Relative					**(EFFCH) Output Oriented Efficiency Change (EFFCH) CRS Relative**				
	y1	y2	y3	y4	bavg	y1	y2	y3	y4	bavg
1	1	0,971	0,917	0,971	0,964	1	0,971	0,917	0,971	0,964
2	1	1	0,781	1,017	0,944	1	1	0,781	1,017	0,944
3	1,306	1	0,942	1,061	1,069	1,306	1	0,942	1,061	1,069
4	0,909	0,994	1,209	1	1,022	0,909	0,994	1,209	1	1,022
5	1	1	1	1	1	1	1	1	1	1
6	1	1	1	1	1	1	1	1	1	1
7	1	1,044	0,836	1,125	0,996	1	1,044	0,836	1,125	0,996
8	1,063	0,918	0,918	1,138	1,005	1,063	0,918	0,918	1,138	1,005
9	1,001	1,108	0,827	1,63	1,106	1,001	1,108	0,827	1,63	1,106
10	1,116	1,235	0,808	1,142	1,062	1,116	1,235	0,808	1,142	1,062
11	1,058	0,972	1,042	1,308	1,088	1,058	0,972	1,042	1,308	1,088
12	1	1	1	1	1	1	1	1	1	1
	1,034	1,018	0,933	1,104		1,034	1,018	0,933	1,104	

Islamic Banking Productivity in Indonesia

Table 6 shows the results of input and output orientation on the same value. This is in accordance with the nature of the EFFCH testing itself relative to the CRS models, so the value changes in the input and output will generate the same value scale. EFFCH Table 6 includes the calculation of Malmquist Index EFFCH within the last 5 years. Measurement starts from the previous year, so the value in row y1 is the result of the second year relative to the first year, and so on.

PECH Table 7 shows results of both input and output orientation producing a different value. This is in accordance with the nature of the PECH testing itself relative to the VRS models, so the value changes in the input and output will produce a different scale values. The table includes the calculation of Malmquist

Index PECH within the last 5 years. Measurement starts from the previous year, so the value in line y1 is the result of the second year relative to the first year, and so on.

Table 7. Malmquist Index of Islamic Banking in Indonesia (PECH)

	Malmquist Input Orientation Pure Efficiency Change (PECH) VRS Technology Related					**Malmquist Output Orientation Pure Efficiency Change (PECH) VRS Technology Related**				
	y1	y2	y3	y4	bavg	y1	y2	y3	y4	Bavg
1	1	1	1	1	1	1	1	1	1	1
2	1	1	0,8	1,16	0,98	1	1	0,78	1,09	0,96
3	1,29	1	1	1	1,07	1,24	1	1	1	1,06
4	0,9	0,98	1,21	1	1,02	0,93	0,97	1,17	1	1,01
5	1	1	1	1	1	1	1	1	1	1
6	1	1	1	1	1	1	1	1	1	1
7	1	0,9	1,03	0,79	0,93	1	0,91	1,02	0,8	0,93
8	0,94	0,86	0,99	0,96	0,94	0,95	0,87	1,01	0,95	0,94
9	1	1	1	1	1	1	1	1	1	1
10	1	1	1	0,93	0,98	1	1	1	0,93	0,98
11	1	1	1	1	1	1	1	1	1	1
12	1	1	1	1	1	1	1	1	1	1
	1,01	0,98	1	0,98		1,01	0,98	1	0,98	

SECH Table 8 shows results of the input and output orientation producing different values, it is in accordance with the nature of the SECH testing itself relative to the SE model, Scale Efficiency namely CRS / VRS scale, so the value changes in the input and output will generate different scale value, The table includes the calculation of Malmquist Index SECH within the last 5 years. Measurement starts from the previous year, so the value in the line y1 is the result of the second year relative to the first year, and so on.

TECHCH table 10 shows the test results of both the input and output orientation on the same value. This means there is no difference when using input Orientation or output Orientation. TECHCH Table includes the calculation of Malmquist Index TECHCH within the last 5 years. Measurement starts from the previous year, so the value in the line y1 is the result of the second year relative to the first year, and so on.

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Islamic Banking Productivity in Malaysia

Output Orientation

For *techch*: 7 banks increased in the first year (Bank: 1, 2, 3, 5, 6, 9 and 12); 5 banks have increased in the second year (Bank: 3, 5, 9, 13 and 15); 12 banks had increased in the third year (Bank: 1, 2, 3, 4, 5, 6, 7, 8, 9, 13, 15 and 16); 3 banks increased in the fourth year (Bank: 2, 4 and 16). For *tfpch*: 8 banks increased in the first year (Bank: 1, 2, 3, 5, 6, 9, 12 and 16); 8 banks increased in the second year (Bank: 3, 4, 5, 6, 9, 13, 15 and 16); 9 banks experienced an increase in the third year (Bank: 1, 2, 3, 4, 8, 9, 13, 15 and 16); 8 banks increased in the fourth year (Bank: 1, 2, 3, 4, 6, 12, 13 and 16). For *effch*: 7 banks increased in the first year (Bank: 1, 3, 6, 7, 12, 13, and 16); 5 banks increased in the second year (Bank: 3, 4, 6 and 16); there are no banks that have increased in the third year; 7 banks increased in the fourth year (Bank: 1, 3, 5, 6, 12, 13 and 16). For *Pech*: 5 banks increased in the first year (Bank: 1, 3, 12, 13 and 16); 1 bank has increased in the second year (Bank 3); 1 bank has increased in the third year (Bank 2); 5 banks have increased in the fourth year (Bank: 1, 3, 12, 13 and 16). For *Sech*: 5 banks have increased in the first year (Bank: 1, 6, 7, 12 and 13); 5 banks have increased in the second year (Bank: 3, 4, 5, 6, and 16); 1 bank has increased in the third year (Bank: 3); 7 banks increased in the fourth year (Bank: 1, 3, 5, 6, 12, 13 and 16).

Table 8. Malmquist Index of Islamic Banking in Indonesia (TECHCH)

	Malmquist Orientasi input Tech Change (TECHCH) Technlogical Related Change				**Malmquist Orientasi Output Tech Change (TECHCH) Technlogical Related Change**				
	y1	y2	y3	y4	y1	y2	y3	y4	bavg
1	0,851	0,961	1,108	0,994	0,851	0,961	1,108	0,994	0,974
2	0,991	0,618	1,041	0,946	0,991	0,618	1,041	0,946	0,881
3	0,889	0,966	1,061	1,035	0,889	0,966	1,061	1,035	0,986
4	0,835	0,998	1,191	1,209	0,835	0,998	1,191	1,209	1,047
5	0,875	0,774	1,29	0,963	0,875	0,774	1,29	0,963	0,958
6	0,954	1,301	1,271	1,136	0,954	1,301	1,271	1,136	1,157
7	0,838	0,931	1,245	0,874	0,838	0,931	1,245	0,874	0,96
8	0,827	0,945	1,195	0,903	0,827	0,945	1,195	0,903	0,958
9	0,807	0,893	1,302	0,978	0,807	0,893	1,302	0,978	0,979

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10	0,982	0,731	1,18	1,021	0,982	0,731	1,18	1,021	0,964
11	0,883	0,951	1,082	1,015	0,883	0,951	1,082	1,015	0,98
12	0,566	0,953	0,911	0,885	0,566	0,953	0,911	0,885	0,812
avg	0,851	0,904	1,151	0,992	0,851	0,904	1,151	0,992	

Input Orientation

For *techch*: 7 banks increased in the first year (Bank: 1, 2, 3, 5, 6, 9, and 12); 5 banks have increased in the second year (Bank: 3, 5, 9, 13 and 15); 12 banks had increased in the third year (Except: 10, 11, 12 and 14); 3 banks increased in the fourth year (Bank: 4, 12 and 15). For *tfpch*: 8 banks increased in the first year (Bank: 1, 2, 3, 5, 6, 9, 12, and 16); 8 banks increased in the second year (Bank: 3, 4, 5, 6, 9, 13, 15, 16); 8 banks experienced an increase in the third year (Bank: 1,2,3,4,8,9,13 and 16); 6 banks increased in the fourth year (Bank: 3, 4, 5, 8, 12 and 15). For *effch*: 7 banks increased in the first year (Bank: 1, 3, 6, 7, 12, 13, and 16); 5 banks have increased in the second year (Bank: 3, 4, 5, 6 and 16); No bank has increased in the third year; 7 banks increased in the fourth year (Bank: 1, 3, 5, 6, 12, 13, 16). For *Pech*: 5 banks have increased in the first year (Bank: 1, 3, 12, 13 and 16); 1 bank has increased in the second year (Bank: 3); 1 bank has increased in the third year (the Bank: 1); 3 banks increased in the fourth year (Bank: 2, 3 and 13). For *Sech*: 5 banks have increased in the first year (Bank: 1, 6, 7, 12 and 13); 5 banks have increased in the second year (Bank: 3, 4, 5, 6 and 16); No bank has increased in the third year; 8 banks increased in the fourth year (Bank: 2, 3, 5, 6, 7, 8, 13, and 16).

Islamic Banking Productivity in Pakistan

For *techch*: 5 banks have increased in the first year (All banks); 1 bank has increased in the second year (Bank 2); 3 banks increased in the third year (Bank: 1, 2 and 3); 4 banks have increased in the fourth year (Bank: 1, 2, 3 and 5). (Valid for both input and output orientation). For *tfpch*: 4 banks increased in the first year (Bank: 1, 2, 4 and 5); 3 banks increased in the second year (Bank: 2, 3 and 4); 3 banks increased in the third year (Bank: 1, 2 and 3); 4 pneingkatan bank experienced in the third year (Bank: 1, 2, 3 and 4). (Valid for both input and output orientation).

For *effch*: 2 banks increased in the first year (Bank: 1 and 2); 2 banks increased in the second year (Bank: 3 and 4); 1 bank has increased in the third year (Bank 2); 1 bank has increased in the fourth year (Bank 2). (Valid for both input and output orientation). For *Pech*: 3 banks increased in the first year (Bank: 1, 2 and 4); 1 bank

has increased in the second year (Bank 4); No bank has increased in the third and fourth year. (Valid for both input and output orientation). For *Sech*: 1 bank has increased in the first year (Bank 1); 2 banks increased in the second year (Bank: 3 and 4); 1 bank increase in the third and fourth year (Bank: 1 and 2). (Valid for both input and output orientation).

Conclusion

The most important part is the fact that many of them have experienced inefficient condition. For instance, Islamic Banking Industry in Indonesia is facing inefficiency that shown by five years average that is not reach 100% efficiency rate. However, Indonesia in the fair condition because Indonesia lies on the 75%+ category that range around 87%-97% efficiency rate. The inefficiency usually caused by external factors not in the managerial factors. In the internal factors, we find that input orientation and output has no significance different. It shown the optimization aspects in the efficiency and expansion of output. In the productivity aspects, we find an increasing growth trend for the last four years, we believe it caused by managerial factors rather than technology factors that could improve efficiency in banking industry.

Malaysia also experiences the problem of inefficiency but the condition is better compared to Indonesia. In five years, the efficiency rate of Malaysia Islamic Bank has not reach 100% efficiency rate. However, Malaysia reach a very good condition of efficiency that lies on the 90%+ range (Approximately 92%-95%).

Similar to Indonesia, the causes of inefficiency are from external factors. Good indicators in input and output shows that Malaysia Islamic Bank reach optimal level in the efficiency of input and also the output expansion. In the productivity aspects, despite of positive and fluctuate trend happened for the last four years, the current condition shows the likelihood of negative growth of productivity for Malaysia Islamic Bank that cause by technological aspects.

Pakistan among the closest country that could reach an efficient rate level for their Islamic banks. Pakistan close to reach 100% efficient rate within the last five years. They obtain the range 99.3%-100% efficient rate. The good indicators shown in the input and output aspects of the Islamic Bank that depict the cost efficiency and in input also the output expansion. In the productivity aspects, positive trend shown and shown the increasing pattern that cause by technology advancement in financial sectors and also the good governance in managerial sectors.

For the next study, we propose additional aspects to be complemented for our research: additional variable such as Return on Assets(RoA) Return on Equity

(RoE), and other similar financial profitability ratio. Also, macroeconomic variable as GDP and Inflation. In addition, different method for similar study might triangulate the result of our study by using the methods like SFA or regression analysis using ANOVA.

The implications of this study can be used as a reference and the development of literacy in Islamic finance, encourage related institutions, universities, education ministries, regulators such as Bank of Indonesia and the FSA and the financial industry to facilitate quality financing research in the field of Islamic finance, facilitation of writing and publication of international standardized scientific papers. For that it is necessary to develop synergies and cooperation between elements or stakeholders in supporting the development of scientific works in this field. It is expected the potential scientific work in the field of Islamic banking and finance in Indonesia in its various aspects can be recognized by the academic community at the international level.

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